What is claimed is:

1. An organic device comprising:
a substrate or a dielectric layer;
a photoresist layer formed on the substrate or dielectric layer, wherein the photoresist layer is provided with a plurality of microgrooves having an alignment direction;
an organic semiconducting layer having alignment formed on the photoresist layer, wherein the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer; and
an electrode.

2. The organic device as claimed in claim 1, wherein the plurality of microgrooves are located in different regions of the substrate, and wherein the microgrooves in the same region have the same alignment direction and the microgrooves in different regions have the same or different alignment directions.

3. The organic device as claimed in claim 2, wherein the plurality of microgrooves include first microgrooves aligned according to a first direction in a first region and second microgrooves aligned according to a second direction in a second region, wherein the first and second directions are different; and
the electrode includes a source and drain, wherein the source and drain are in contact with the

organic semiconducting layer to form a channel between the source and drain, wherein the organic semiconducting layer in the channel region aligns according to the first direction and the organic semiconducting layer in the non-channel region aligns according to the second direction.

4. The organic device as claimed in claim 1, which is a top-gate type transistor and comprises:

a substrate;

a photoresist layer formed on the substrate, wherein the photoresist layer is provided with a plurality of microgrooves having an alignment direction;

an organic semiconducting layer having alignment formed on the photoresist layer, wherein the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer; and

a source and a drain formed on the organic semiconducting layer to form a channel between the source and drain, wherein the channel has a channel direction the same as the alignment direction of the microgrooves;

a dielectric layer formed on the organic semiconducting layer, the source, and drain; and

a gate formed on the dielectric layer.

5. The organic device as claimed in claim 1, which is a top-gate type transistor and comprises:

a substrate;

a photoresist layer formed on the substrate, wherein the photoresist layer is provided with a plurality of microgrooves having an alignment direction;

a source and a drain formed on the photoresist layer and being in contact with the microgrooves of the photoresist layer respectively;

an organic semiconducting layer having alignment formed on the photoresist layer, the source, and the drain, wherein the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer, such that a channel is formed between the source and drain and the channel has a channel direction the same as the alignment direction of the microgrooves;

a dielectric layer formed on the organic semiconducting layer; and

a gate formed on the dielectric layer.

6. The organic device as claimed in claim 1, which is a bottom-gate type transistor and comprises:

a substrate;

a gate formed on the substrate;

a photoresist layer formed on the gate, wherein the photoresist layer is provided with a plurality of microgrooves having an alignment direction;

an organic semiconducting layer having alignment formed on the photoresist layer, wherein the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer; and

a source and a drain formed on the organic semiconducting layer to form a channel between the source and drain, wherein the channel has a channel direction the same as the alignment direction of the microgrooves.

7. The organic device as claimed in claim 6, further comprising a dielectric layer formed between the gate and the photoresist layer.

8. The organic device as claimed in claim 1, which is a bottom-gate type transistor and comprises:

a substrate;

a gate formed on the substrate;

a photoresist layer formed on the gate, the photoresist layer is provided with a plurality of microgrooves having an alignment direction;

a source and a drain formed on the photoresist layer and being in contact with the microgrooves of the photoresist layer respectively; and

an organic semiconducting layer having alignment formed on the photoresist layer, the source, and the drain, wherein the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer, such that a channel is

formed between the source and drain and the channel has a channel direction the same as the alignment direction of the microgrooves.

9. The organic device as claimed in claim 8, further comprising a dielectric layer formed between the gate and the photoresist layer.

10. The organic device as claimed in claim 1, wherein the microgrooves have a depth of 0.3 μm to 1 μm.

11. The organic device as claimed in claim 1, wherein the microgrooves have a width pitch of 0.5 μm to 2 μm.

12. The organic device as claimed in claim 1, wherein the substrate is a silicon wafer, glass, quartz, a plastic substrate, or a flexible substrate.

13. The organic device as claimed in claim 1, wherein the dielectric layer has a dielectric constant higher than 3.

14. The organic device as claimed in claim 13, wherein the dielectric layer is inorganic material or polymer material.

15. A process for forming an organic semiconducting layer having molecular alignment, comprising the following steps:

forming a photoresist layer on a substrate or a dielectric layer;

subjecting the photoresist layer to a photolithography process through a mask to form

a plurality of microgrooves with an alignment direction; and

forming an organic semiconducting layer on the photoresist layer having microgrooves, such that the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer.

16. The process as claimed in claim 15, wherein the photolithography process forms a plurality of microgrooves in different regions of the substrate, wherein the microgrooves in the same region have the same alignment direction and the microgrooves in different regions have the same or different alignment directions.

17. The process as claimed in claim 16, further comprising the following steps:

forming first microgrooves aligned according to a first direction in a first region of the substrate, and concurrently forming second microgrooves aligned according to a second direction in a second region of the substrate, wherein the first and second directions are different; and

forming a source and a drain, wherein the source and drain are in contact with the organic semiconducting layer having alignment, such that a channel is formed between the source and drain, the organic semiconducting layer in the channel region aligns according to the first direction and the organic semiconducting layer

in the non-channel region aligns according to the second direction.

18. The process as claimed in claim 15, wherein the substrate is a silicon wafer, glass, quartz, a plastic substrate, or a flexible substrate.

19. The process as claimed in claim 15, wherein the organic semiconducting layer is formed by deposition.

20. The process as claimed in claim 19, wherein the organic semiconducting layer is formed by vacuum evaporation, vapor deposition, solution deposition, or directional deposition.

21. The process as claimed in claim 15, wherein the step of forming the photoresist layer forms the photoresist layer having a thickness of 0.5 μm to 5 μm.

22. The process as claimed in claim 21, wherein the microgrooves have a depth of 0.3 μm to 1 μm.

23. The process as claimed in claim 21, wherein the microgrooves have a width pitch of 0.5 μm to 2 μm.

24. A process for forming an organic device, comprising the following steps:

forming a photoresist layer on a substrate or a dielectric layer;

subjecting the photoresist layer to a photolithography process through a mask to form a plurality of microgrooves having an alignment direction;

forming an organic semiconducting layer on the photoresist layer having microgrooves, such that the organic semiconducting layer aligns according to the alignment direction of the microgrooves of the photoresist layer; and

forming an electrode.

25. The process as claimed in claim 24, wherein the photolithography process forms a plurality of microgrooves in different regions of the substrate, wherein the microgrooves in the same region have the same alignment direction and the microgrooves in different regions have the same or different alignment directions.

26. The process as claimed in claim 25, wherein

the photolithography process includes forming first microgrooves aligned according to a first direction in a first region of the substrate, and concurrently forming second microgrooves aligned according to a second direction in a second region of the substrate, wherein the first and second directions are different; and

the step of forming the electrode includes forming a source and a drain, wherein the source and drain are in contact with the organic semiconducting layer having alignment, such that a channel is formed between the source and drain, the organic semiconducting layer in the channel region aligns according to the first direction and the organic semiconducting layer

in the non-channel region aligns according to the second direction.

27. The process as claimed in claim 24, wherein the substrate is a silicon wafer, glass, quartz, a plastic substrate, or a flexible substrate.

28. The process as claimed in claim 24, wherein the organic semiconducting layer is formed by deposition.

29. The process as claimed in claim 28, wherein the organic semiconducting layer is formed by vacuum evaporation, vapor deposition, solution deposition, or directional deposition.

30. The process as claimed in claim 24, wherein the step of forming the photoresist layer forms the photoresist layer having a thickness of 0.5 μm to 5 μm.

31. The process as claimed in claim 30, wherein the microgrooves have a depth of 0.3 μm to 1 μm.

32. The process as claimed in claim 30, wherein the microgrooves have a width pitch of 0.5 μm to 2 μm.

33. The process as claimed in claim 24, wherein the dielectric layer has a dielectric constant higher than 3.

34. The process as claimed in claim 33, wherein the dielectric layer is inorganic material or polymer material.

35. The process as claimed in claim 24, wherein the organic device is a top-gate type organic thin film transistor (OTFT).

36. The process as claimed in claim 24, wherein the organic device is a bottom-gate type organic thin film transistor (OTFT).